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ABSTRACT

A study examined the effects of instruction in the use of the Internet and prior computer experience on the concerns preservice teachers have about the use of technology in teaching. Subjects were 53 college sophomores, all elementary education majors and members of classes studying the foundations of reading. Participants were surveyed using the Stages of Concern toward an Innovation (George, Hall, Rutherford, 1977) to determine levels of prior experience, pre-treatment, and posttreatment levels of concern. Two directed academic tasks were completed requiring use of the Internet. Paired t-tests revealed significant changes for all participants in the areas of awareness, information, consequence, and refocusing. Results indicated an increase in levels of concern for participants. Findings suggest that short term instruction in the use of the Internet can effect a change in the concerns preservice teachers hold; trends in the changes in levels of concern are influenced partially by experience. (Contains eight references, five tables of data, and three figures.) (Author/CR)

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Running head: PRESERVICE TEACHERS AND CONCERNS REGARDING THE INTERNET

ED 409 592

Effects of Internet Instruction and Computer Experience on Preservice Teachers' Concerns About Its Place in Planning and Teaching

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Abstract

The purpose of this study was to determine the effects of instruction in the use of the Internet and prior computer experience on the concerns preservice teachers have about the use of technology in teaching. Fifty-three participants were surveyed using the Stages of Concern toward an Innovation (George, Hall, Rutherford, 1977) to determine levels of prior experience, pre-treatment, and posttreatment levels of concerns. Two directed academic tasks were completed requiring use of the Internet. Paired t-tests revealed significant changes for all participants in the areas of Awareness, Information, Consequence and Refocusing. Increase in levels of concern for participants with prior experience were seen in the areas of Consequence, Collaboration, and Refocusing; those with limited prior experience, Personal, Management, Consequence, Collaboration, and Refocusing; no prior experience, Consequence and Refocusing, with a notable decrease in Awareness-related concerns. General conclusions: short term instruction in the use of the Internet can effect a change in the concerns preservice teachers hold; trends in the changes in levels of concern are influenced partially by experience.

Effects of internet instruction and computer experience on preservice teachers' concerns about its place in planning and teaching

Theoretical Background

E-mail, file transfers via communications, and direct talk modes via networked computers, is not only a vital component of business and private life, but has become a quick, efficient, and dependable information source for more than thirty million people. (Russett, 1994). The Internet, a product of Arpnet (a United States Defense Department network of the early 1970's) and NSFnet (a late 1980's electronic network set up by the National Science Foundation for linking colleges and universities), connects users to the world's largest and most complex library with approximately fifty thousand databases in the system (Pool, 1993).

A central feature of the High Performance Computing Act of 1991 was the establishment of a National Research and Education Network (NREN). This group, made up of leaders from state Education Departments, universities, and public and private organizations and foundations, recommended the expansion of Internet and assistance from the federal government in connecting public schools in every congressional district to Internet. (Consortium for School Networking, 1991). In 1993, NREN met at a convention to explore the types of network sources most useful for educators and to identify design issues most critical for implementing networking in the schools.

It seemed apparent that greater emphasis would be placed on telecommunications in the schools of the future as teachers relied increasingly on computers in the classroom. In fact, many schools are already using telecommunications to obtain and distribute information from school to school and to overcome the isolation of teaching in small communities, far from peers in other geographic areas.

While the Internet can be used as both a communication and a research tool, the majority of programs reported in the research during the last four years were using Internet to improve communication among teachers, university students, and cooperating teachers. Most of

the articles written since 1992 were descriptive, outlining the strategies designed to implement individual programs and alerting educators to problems that could be avoided. Russett (1994) states that it is not difficult to find information describing how enterprising teachers use telecommunications in their classrooms; however, it is very difficult to find studies describing how teacher education institutions can (or should) employ telecommunications.

In addition, it is often assumed that, in this age of technology, all university students enrolled in classes have some experience with computers and, given instruction, will choose to use the Internet as a source of information when writing papers, conducting research projects, or planning units of study. University instructors can require students to sign up for Internet services and plan activities that involve using Internet but individuals who experience computer anxiety become very skillful in avoiding responsibility for these tasks.

One way to facilitate future teachers' use of technology in their classrooms is to model uses in our teacher education classes and provide opportunities for them to become acquainted with and make application of its uses. Research has shown the calming effects of experience with computers on anxiety levels (Fann, Lynch, & Murranka, 1989; Kay, 1990; Summers, 1990). Our presumption was that preservice teachers who have experience using the Internet as a resource while they're in college will be more likely to use it as a teaching tool in their classrooms. This study included directed use of the Internet in planning instruction and as a research resource.

The purpose of this study was to determine the effects of instruction in the use of the Internet and prior computer experience on the concerns preservice teachers have about the use of technology in teaching, and was framed by the following questions:

1. What effect does Internet instruction have on the concerns preservice teachers have about the use of technology?

2. What is the effect of computer experience on the levels of concern about the use of technology?

Method

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Participants

This study looked at fifty-three college sophomores, all elementary education majors, and members of one of two intact classes studying the foundations of reading. Participants were divided into three groups according to their responses to the following statements in the Stages of Concern survey (see Appendix):

Statement 3: I don't even know what the Internet is.

Statement 6: I have very limited knowledge about the Internet.

Group 1 (n=8) prior experience, responded with "not true of me now;" Group 2 (n=24) limited prior experience, responded with "somewhat true of me now;" Group 3 (n=21) no prior experience, responded with "very true of me now." All groups received the same treatment and completed the same tasks.

Instrument. The Stages of Concern toward an Innovation (George, Hall, Rutherford, 1977) was administered to determine levels of prior experience, pre-treatment, and posttreatment levels of concerns. For this study, the innovation was defined as the use of the Internet as a teaching and learning resource. Surveys were administered at the beginning and end of the Spring, 1996 semester. Reed (1990) reports the rationale of this instrument:

> When people are exposed initially to an innovation, their concerns tend to be very self-oriented. . . Once these concerns are accommodated, they become more concerned about managing the innovation in their teaching, how the innovation will affect their students, how they might work with others in relation to the innovation, and when best to use the innovation (p.7).

The Stages of Concern instrument includes the seven stages identified by George, Hall, and Rutherford (1977). (Appendix A)

- First Stage is Awareness: I am not concerned about the Internet.
- Second stage is Informational: I would like to know more about the Internet.

- Third stage is Personal: How will using the Internet affect me?
- Fourth stage is Management: I seem to be spending all my time getting material ready when using the Internet.
- Fifth stage is Consequence: How is my use of the Internet affecting my students?
- Sixth stage is Collaboration: I am concerned about relating my use of the Internet with what other instructors are doing with it.
- Seventh stage is Refocusing: I have some ideas about how something might work better.

Treatment. All students received a one-hour orientation to and instruction in using the Internet. Their familiarity with computers varied from none-at-all to experienced user. Their familiarity with the Internet also varied.

Instruction in navigating the Internet and finding information using the World Wide Web included:

- a definition of the World Wide Web
- logging on to the computer system
- accessing the Internet
- navigating the Internet via various web "browsers"
    - Lynx
    - www
    - Mosaic
    - MacWeb
    - NetScape
- explanation of a URL
- where to find the subject catalog of the Web
- names and focuses of automatic indexes (search engines)
    - Yahoo
    - Lycos

- WebCrawler
- World Wide Web Worm
- InfoSeek
- OpenText

- 30-40 minutes of independent navigating

Task. Following treatment, students were assigned to work with a partner to complete two directed academic tasks requiring use of the Internet. Task #1 required locating a web site dedicated to a special interest not typically included in a focus on reading and writing skills. For example: music, Civil War, astronomy, photography, fishing, gardening, sports, etc. The sophomores were to design a lesson to integrate the information at this site into a literacy lesson. Task #2 required the sophomores todevelop an annotated bibliography of five web sites that would be useful to them as a teacher. These sites could include those with lesson plans, book lists, articles to further their professional development, etc.

Results

Paired t-tests were performed to determine any significant changes in levels of concern effected by treatment and/or experience.

Question 1: What effect does Internet instruction have on the concerns preservice teachers have about the use of technology?

As shown in Table 1, paired t-tests for all participants revealed significant changes in the levels of concern relevant to Awareness, Information, Consequence, and Refocusing.

In the area of Awareness, the significant decrease from -2.43 to -3.29 ($p > .0018$) indicates that the treatment and directed tasks resulted in a keener awareness of the uses of the Internet, versus a continued general apathy about its functions and relevance to teaching.

In the area of Informational concerns, there was a significant decrease from -3.32 to -4.98 ($p > .0001$). This significant decrease may indicate a lack of "need to know" about the Internet, due to their rising levels of comfort in using the technology and applying the information to serve their purposes.

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In the area of Consequence, there was a significant increase from 3.33 to 4.11 ($p > .0001$). This increase clearly indicates a gain in understanding of the possible effects use of the Internet in teaching might have on their students.

Finally, in the area of Refocusing, there was a significant increase from 3.13 to 3.95 ($p > .0002$). This increase indicates their awareness of when to use the Internet in teaching, and possibly more effective ways to incorporate its use into instructional planning.

Question 2: What is the effect of prior computer experience on the levels of concern preservice teachers have about the use of technology?

As shown in Table 2 and Figure 1, posttreatment scores of participants with prior experience (Group 1) revealed an increase in all stages of concern; the greatest increases show in Consequence (pretreatment 49.8, posttreatment 65.8), Collaboration (pretreatment 57.8, posttreatment 73.1), and Refocusing (pretreatment 76, posttreatment 82.3).

As shown in Table 3 and Figure 2, posttreatment scores of participants with limited prior experience (Group 2) revealed an increase in levels of concern in Personal (pretreatment 88.8, posttreatment 92), Management (pretreatment 66.5, posttreatment 78.4), Consequence (pretreatment 55.5, posttreatment 63.5), Collaboration (pretreatment 60.2, posttreatment 65.1), and Refocusing (pretreatment 77.8, posttreatment 82).

As shown in Table 4 and Figure 3, posttreatment scores for participants with no prior experience (Group 3) revealed an increase in levels of concern in the areas of Consequence (pretreatment 44.9, posttreatment 56.6) and Refocusing (pretreatment 64.6, posttreatment 77.9). There was a notable decrease in their concerns related to Awareness (pretreatment 67.8, posttreatment 49). This shift indicates their probable gain in understanding of what the Internet is and its relevance to teaching.

General Conclusions and Discussion

Based on the significant increases in all areas of concern for all participants, it is reasonable to conclude that short term instruction in the use of the Internet can effect a positive

change in the way preservice teachers view this technology as a resource for planning and teaching.

Further, trends in the changes in stages of concern are influenced partially by the level of prior experience the participants had in the use of computers and the Internet. Posttreatment scores of participants with prior experience revealed an increase in all stages of concern; the greatest increase shown in Consequence, Collaboration, and Refocusing. Posttreatment scores of participants with limited prior experience revealed an increase in Personal, Management, Consequence, Collaboration, and Refocusing. Posttreatment scores of participants with no prior experience revealed an increase in Consequence and Refocusing concerns. There was a notable decrease in their Awareness-related concerns.

References

Consortium for School Networking. (1991). Position paper on school networking. In D. Carey (Ed.). Technology and teacher education annual 1992. Proceedings of the annual conference on technology and teacher education. (1992). Association for the Advancement of Computing in Education.

Fann, G. L., Lynch, D. H. & Murranka, P. (1989). Integrating technologies: Attitudes as a determinant on the use of microcomputers. Journal of Educational Technology Systems, 17, 307-317.

Hall, G. E., George, A. A., & Rutherford, W. L. (1977). Measuring the stages of concern about the innovation: A manual for use of the stages of concerns questionnaire. Austin: Research and Development Center for Teacher Education. The University of Texas.

Kay, R. H. (1990). The relation between locus of control and computer literacy. Journal of Research on Computing in Education, 22, 464-474.

Pool, R. (1993). Beyond databases and e-mail. Science, 261, 841-843.

Reed, W. M. (1990). The effect of computer-and-writing instruction on prospective english teachers' attitudes toward and perceived uses of computers in writing instruction. Journal of Research on Computing in Education, 23, 3-27.

Russett, J. A. (1994). Telecommunications and preservice science teachers: The effects of using electronic mail and a directed exploration of Internet on attitudes. Paper presented at the Annual Meeting of the Association for Research in Science Teaching, Anaheim, Ca.

Summers, M. (1990). New student teachers and computers: An investigation of experiences and feelings. Educational Review, 42, 261-271.

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Table 1

Posttreatment Mean Scores for Stages of Concern for all Groups

Stage of Concern	N	Mean	T	p
Awareness	53	-2.43	-3.29	.0018[a]
Informational	53	-3.32	-4.98	.0001[b]
Personal	53	-0.16	-0.23	.817
Management	53	-0.47	-0.42	.675
Consequence	53	3.33	4.11	.0001[c]
Collaboration	53	2.17	2.74	.0083
Refocusing	53	3.13	3.95	.0002[d]

[a] = The significant decrease in awareness-related concerns indicates that the instruction and tasks made them much more aware of what the Internet and its uses are. High scores for awareness-related concerns translate to low awareness or general apathy toward the Internet.

[b] = The significant decrease in informational-related concerns indicates a possible lack of need to find out more about the Internet.

[c] = The significant increase in consequence-related concerns indicates a gain in their understanding of how they would use the Internet in their teaching. his may have been influenced by the nature of the tasks. That is, searching the Internet for specific sites appropriate to content area and literacy instruction.

[d] = The significant increase in refocusing-related concerns indicates their closer evaluation of the role of the Internet in the classroom.

Table 2

Pretest and Posttest Mean Scores for Stages of Concern of Participants with Prior Experience (Group 1)

Stages of Concern	Pre	Post
Awareness	35.9	38.7
Informational	80.3	83.6
Personal	81.8	85.4
Management	52.4	60.8
Consequence	49.8	65.8
Collaboration	57.8	73.1
Refocusing	76.0	82.3

Table 3

Pretest and Posttest Mean Scores for Stages of Concern of Participants with Limited Prior Experience (Group 2)

Stages of Concern	Pre	Post
Awareness	53.0	49.0
Informational	92.4	88.3
Personal	88.8	92.0
Management	66.5	78.4
Consequence	55.5	63.5
Collaboration	60.2	65.1
Refocusing	77.8	82.0

Table 4

Pretest and Posttest Mean Scores for Stages of Concern of participants with No Prior Experience (Group 3).

Stages of Concern	Pre	Post
Awareness	67.8	49.0
Informational	96.7	94.7
Personal	90.6	89.4
Management	83.6	80.7
Consequence	44.9	56.6
Collaboration	57.2	54.7
Refocusing	64.6	77.9

Table 5.

Pretreatment and Posttreatment Means for All Groups

Stages of Concern	Group 1 Pre	Means Post	Change	Group 2 Pre	Means Post	Change	Group 3 Pre	Means Post	Change
Awareness	35.9	38.7	+2.8	53.0	49.0	-4	67.8	49.0	-18.8
Informational	80.3	83.6	+3.3	92.4	88.3	-4.1	96.7	94.7	-2
Personal	81.8	85.4	+3.6	88.8	92.0	+3.2	90.6	89.4	-1.2
Management	52.4	60.8	+8.4	66.5	78.4	+11.9	83.6	80.7	-2.9
Consequence	49.8	65.8	+16	55.5	63.5	+8	44.9	56.6	+11.7
Collaboration	57.8	73.1	+15.3	60.2	65.1	+4.9	57.2	54.7	-2.5
Refocusing	76.0	82.3	+6.3	77.8	82.0	+4.2	64.6	77.9	+13.3

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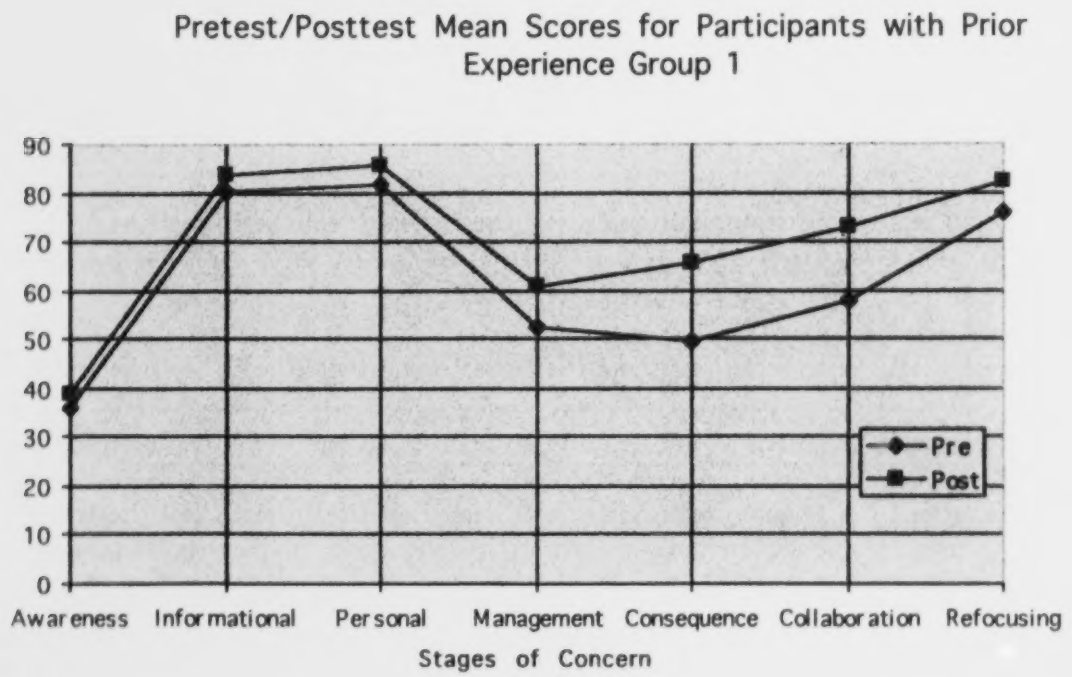
Pretest/Posttest Mean Scores for Participants with Prior Experience Group 1
90
80
70
60
50
40
30
20
10
0
Awareness
Informational
Personal
Management
Consequence
Collaboration
Refocusing
Stages of Concern
Pre
Post

Figure 1.

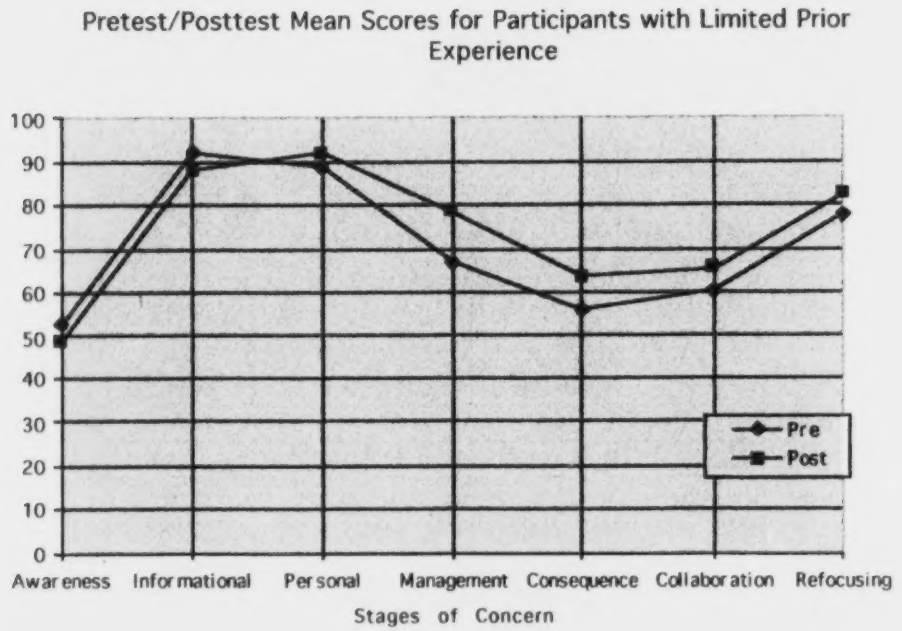
Pretest/Posttest Mean Scores for Participants with Limited Prior Experience
100
90
80
70
60
50
40
30
20
10
0
Awareness
Informational
Personal
Management
Consequence
Collaboration
Refocusing
Stages of Concern
Pre
Post

Figure 2.

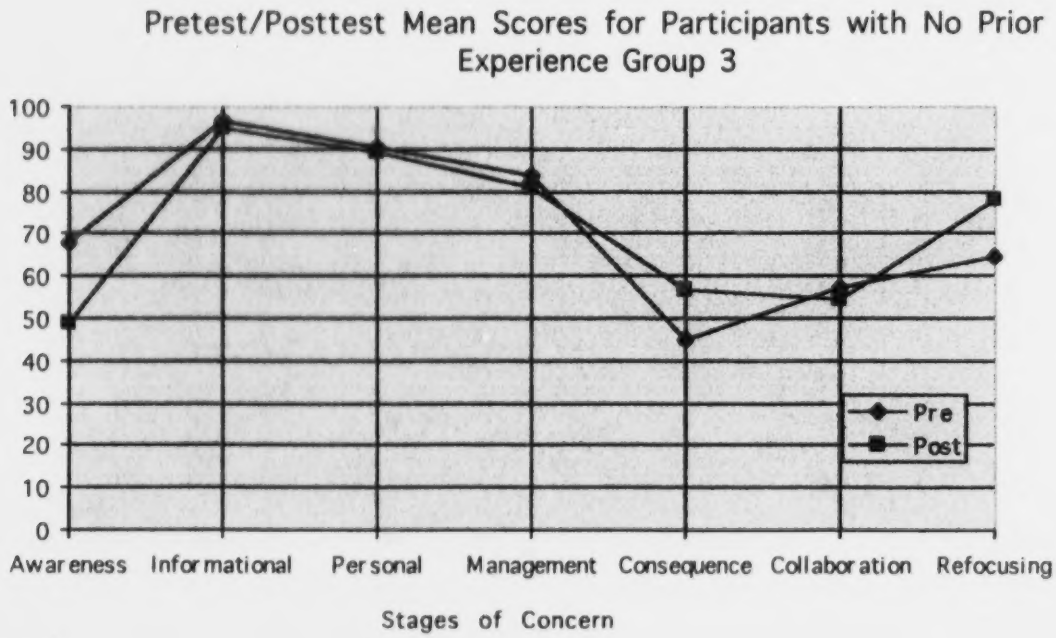
Pretest/Posttest Mean Scores for Participants with No Prior Experience Group 3
100
90
80
70
60
50
40
30
20
10
0
Awareness
Informational
Personal
Management
Consequence
Collaboration
Refocusing
Pre
Post
Stages of Concern

Figure 3.